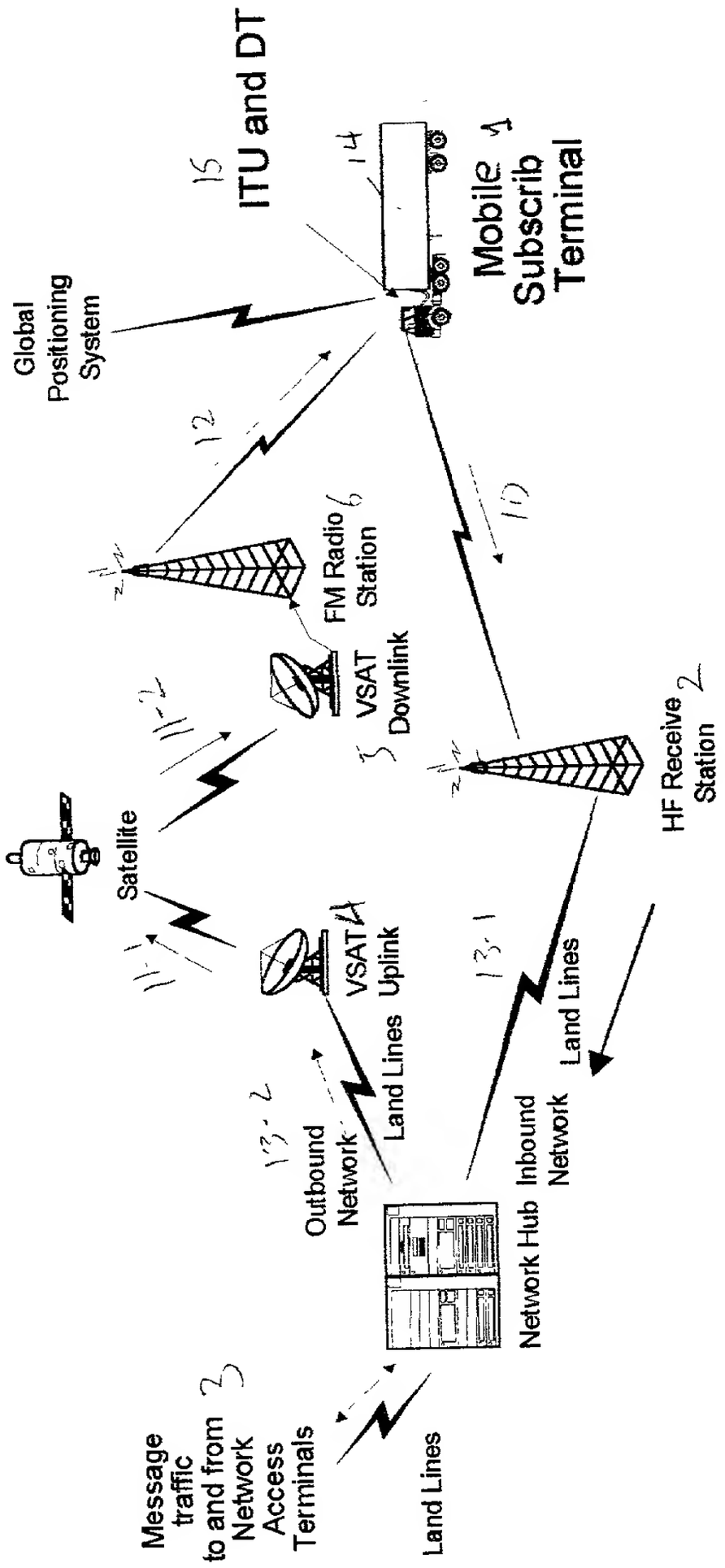
15
ITU and DT
14
Mobile
Subscrib
Termina
Global
Positioning
System
12
FM Radio
Station
6
VSAT
Downlink
5
11-2
Satellite
11-1
VSAT
Uplink
4
HF Receive
Station
2
13-1
13-2
Land Lines
Land Lines
Outbound
Network
Inbound
Network
Network Hub
Message
traffic
to and from
Network
Access
Terminals
3
Land Lines

FIG. 1

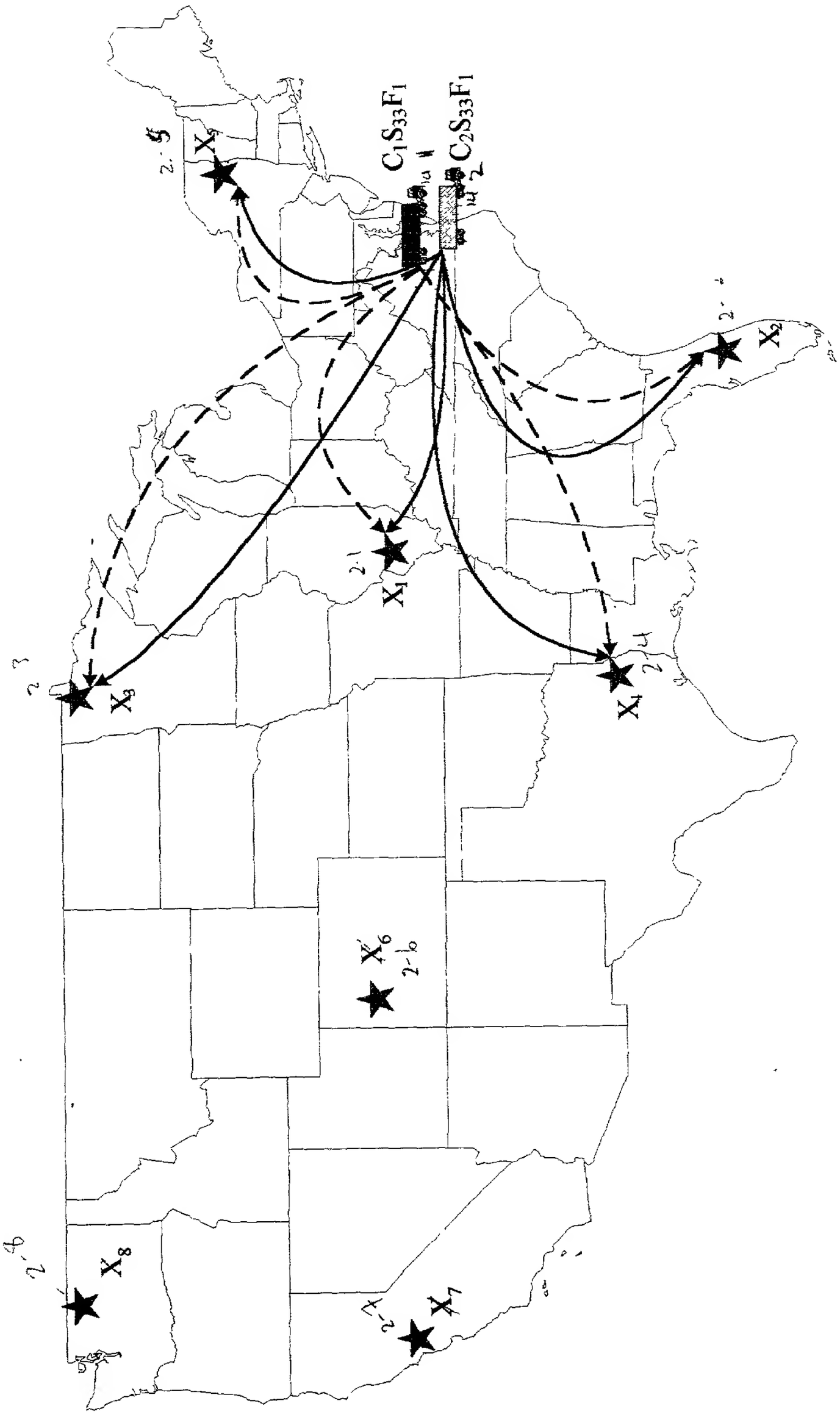

FIG. 2

Prior Art : Terion Low Rate HF Modulator

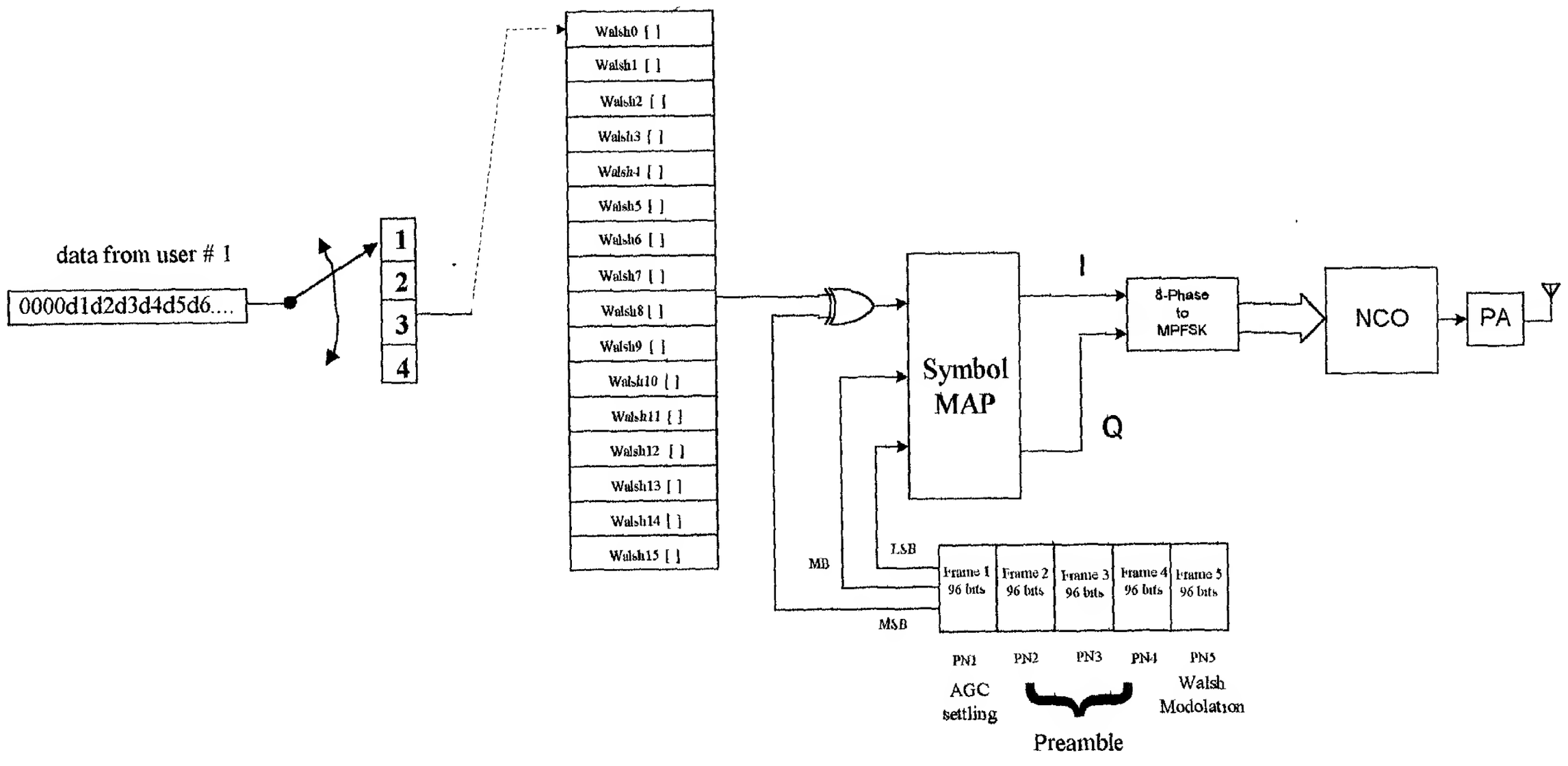

FIG. 3

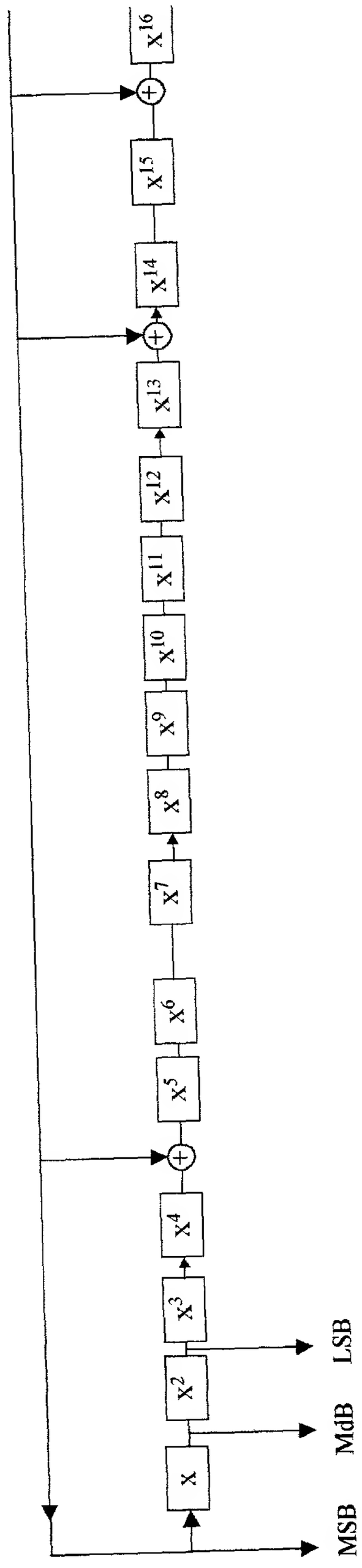

FIG. 4

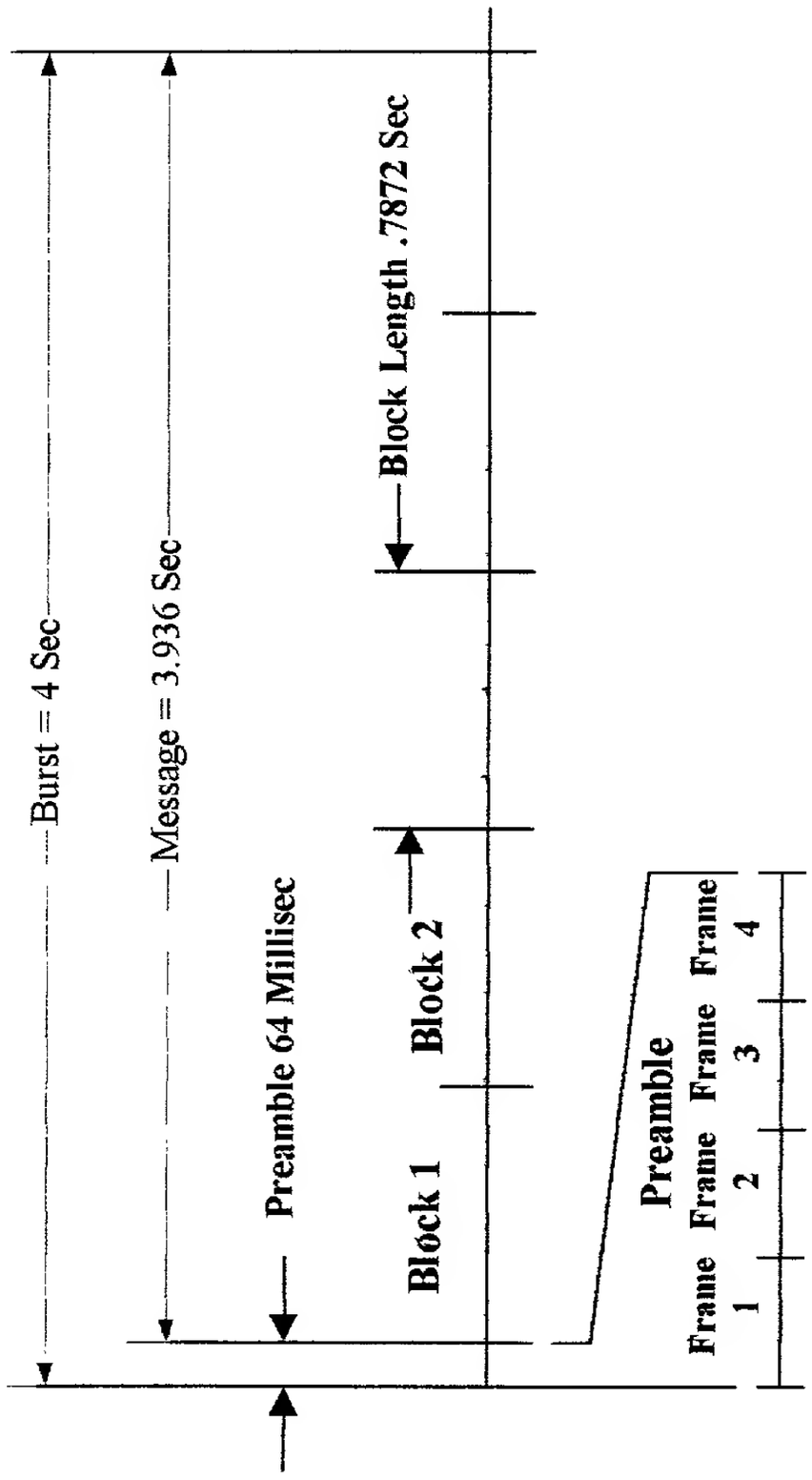
Burst = 4 Sec
Message = 3.936 Sec
Block Length .7872 Sec
Preamble 64 Millisec
Block 1
Block 2
Preamble
Frame 1
Frame 2
Frame 3
Frame 4

FIG. 5

New Low Rate HF Modulator Using Orthogonal Codes

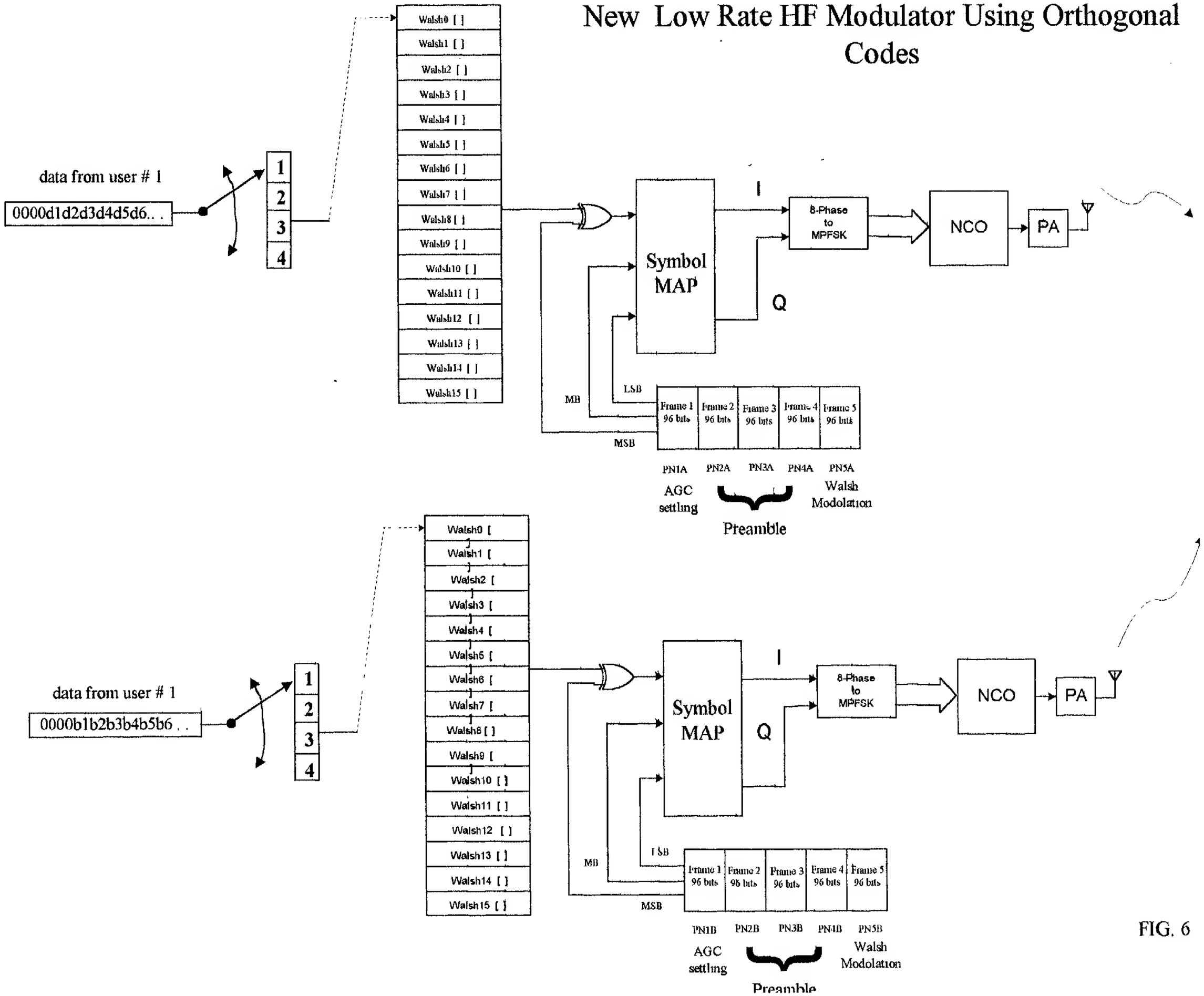

FIG. 6

New Demodulator set to receive users of orthogonal code A

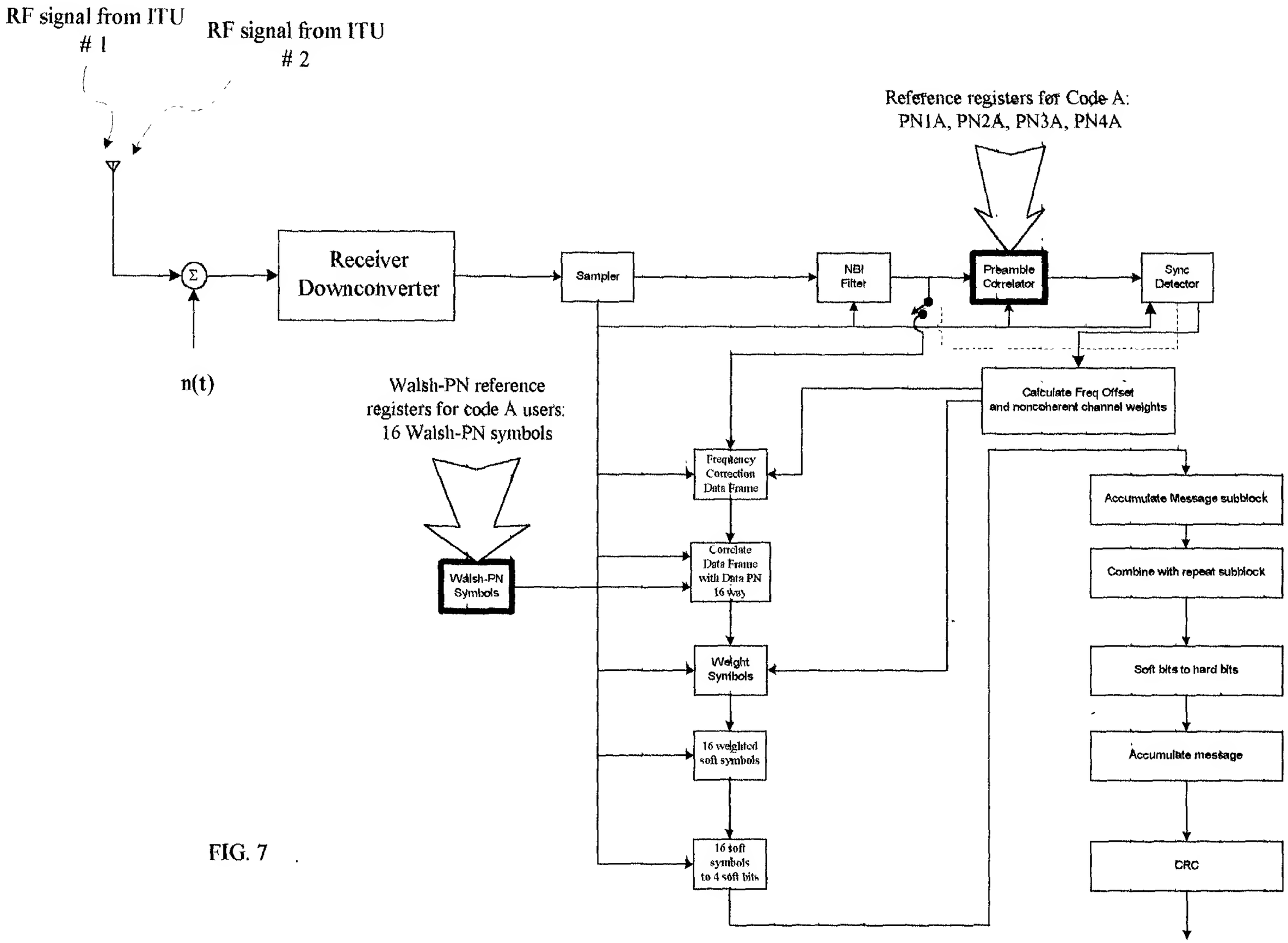

FIG. 7

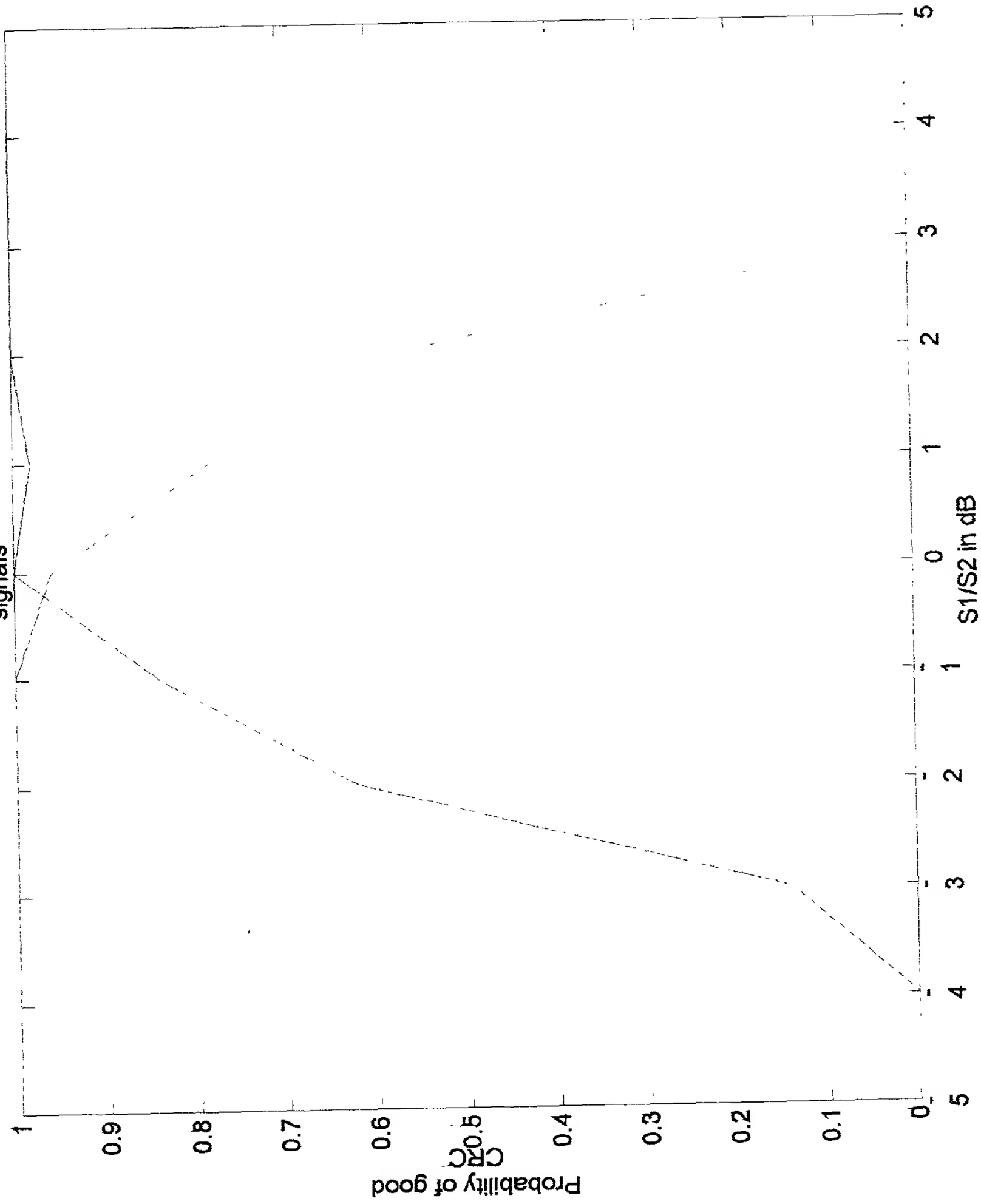
Block Orthogonal Codes (50 samples per SNR)
delay [0 25 msecs] uniformally distributed between transmitted signals
Probability of good CRC
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
5
4
3
2
1
0
1
2
3
4
5
S1/S2 in dB

FIG. 8

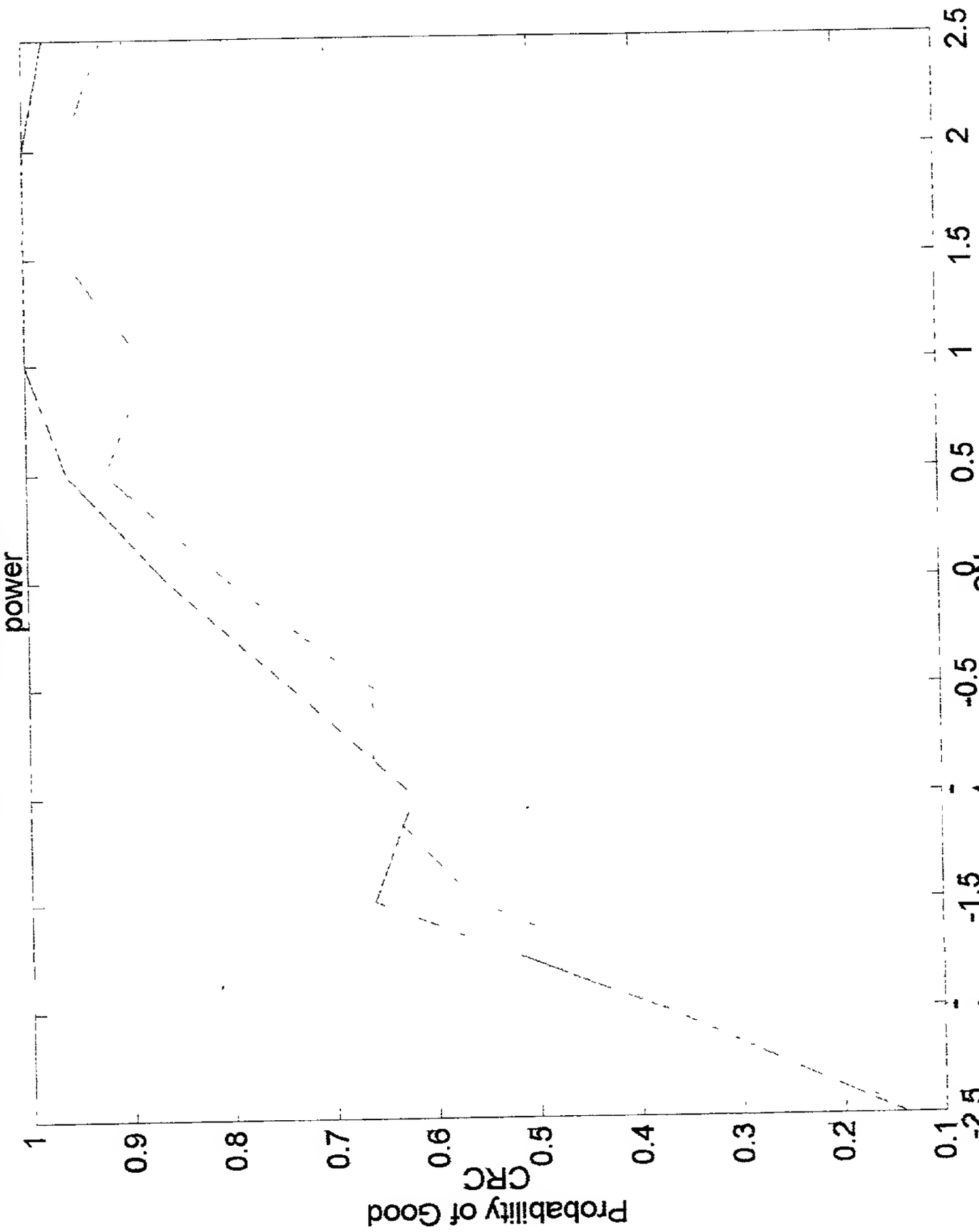
1 Block message both signals have equal power
Probability of Good CRC
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
SNR
2.5

FIG. 9

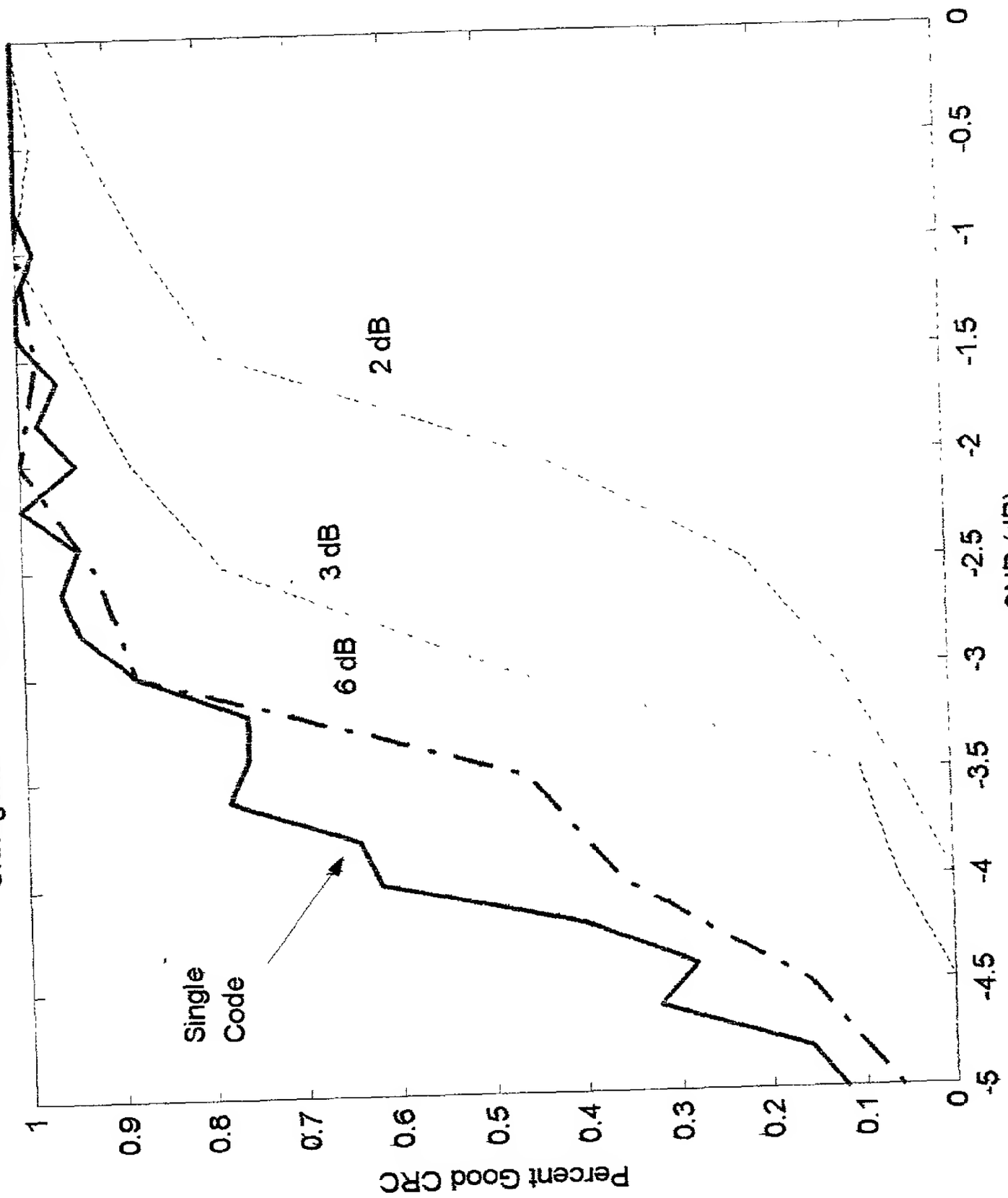
Orthogonal for 1 block with S1 0 to 6 dB below S2
Single Code
6 dB
3 dB
2 dB
Percent Good CRC
SNR (dB)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5

FIG. 10